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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,806	09/25/2003	Malte Blomeyer	2001P04429WOUS	7583

7590 10/04/2005

SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPT.
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EXAMINER	
KIM, TAE JUN	
ART UNIT	**PAPER NUMBER**
3746	

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/670,806	BLOMEYER, MALTE	
	Examiner	Art Unit	
	Ted Kim	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/12/2005 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 7, 9-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Becker (6,152,724). Becker teaches a burner apparatus for burning fuel and air to combustion gas comprising a premixing chamber 4 for premixing the fuel and air with an air inlet for the air 5 to enter said premixing chamber and having a cross-sectional area; a fuel inlet 11, 12 for the fuel to enter said premixing chamber an outlet for a mixture of air and fuel to exit said premixing chamber, wherein, swirl element 9, said fuel inlet 11, 12 is located between said air inlet and said outlet, further comprising at least one air blocking member 13 situated at the air inlet for stabilizing a burner premixing flame by locally

blocking the flow of air entering said premixing chamber so that downstream of said outlet a locally inhomogeneous fuel concentration with a locally enriched fuel mixture toward a wall of the burner (e.g. col. 3, lines 5-24 or col. 5, lines 56+, note that largely homogenous implies local areas of inhomogeneous) which inherently generates a locally hot stream of combustion gas that is hotter than the average flame temperature; said air inlet has in said cross-sectional area an outer periphery and with said at least one blocking member located at the outer periphery extending towards said main axis; swirl elements 9; a pilot burner may be present (col. 5, lines 31+); a gas turbine is taught (see abstract); recirculation zone 10 is taught; the claimed area ratios are shown in either Figs 4 or 5. A premixing chamber 4 for premixing the fuel and air having a cross-sectional area and extending along a main axis 1, and said premixing chamber comprises a ring channel, with said air inlet having a annulus cross-sectional area inclined to said main axis 1, comprising a swirl element 9 disposed in said ring channel for imposing a momentum to said flow of air and for feeding said fuel 11, 12 in said flow of air; an air inlet having a cross sectional area and an outer periphery for the air to enter said premixing chamber, and a fuel inlet 11, 12 for fuel to enter said premixing chamber, and an outlet for a mixture of the fuel and air; the fuel inlet is located between the air inlet and outlet.

4. Claims 1-3, 7, 9-13, 15, 17-19, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Poeschl et al (6,189,320). Poeschl et al teach a burner apparatus for burning fuel and air to combustion gas comprising a premixing chamber for premixing

the fuel and air with an air inlet for the air to enter said premixing chamber and having a cross-sectional area; swirl element 5, a fuel inlet 6 for the fuel to enter said premixing chamber, an outlet for a mixture of air and fuel to exit said premixing chamber, wherein, said fuel inlet is located between said air inlet and said outlet, further comprising at least one air blocking member 4 situated at the air inlet for stabilizing a burner premixing flame by locally blocking the flow of air entering said premixing chamber so that downstream of said outlet a locally inhomogeneous fuel concentration results (col. 3, lines 5+, note that largely homogenous implies local areas of inhomogeneous) which inherently generates a locally hot stream of combustion gas that is hotter than the average flame temperature; said air inlet has in said cross-sectional area an outer periphery and with said at least one blocking member located at the outer periphery extending towards said main axis; swirl elements 5; a pilot burner 9 is present; a gas turbine is taught (see abstract); a recirculation zone at the outer periphery of the outlet is inherently present as the outlet configuration of Poeschl et al appears identical to that of the disclosed invention and it is well known in the art that the sudden expansion of the flow at the outlet will inherently cause recirculation zones. A premixing chamber for premixing the fuel and air having a cross-sectional area and extending along a main axis 12, and said premixing chamber comprises a ring channel, with said air inlet having a annulus cross-sectional area inclined to said main axis 12, comprising a swirl element 5 disposed in said ring channel for imposing a momentum to said flow of air and for feeding said fuel 6 in said flow of air; an air inlet having a cross sectional area and an outer periphery for the

air to enter said premixing chamber, and a fuel inlet 6 for fuel to enter said premixing chamber, and an outlet for a mixture of the fuel and air; the fuel inlet 6 is located between the air inlet and outlet; the air blocking member is located at the outer periphery, situated at the air inlet and extending toward the main axis.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 7-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker (6,152,724) in view of Becker (5,451,160). Becker '724 teaches the blocking members 13 in the inlet region but not in the upstreammost portion, i.e. at the outer periphery situated at the air inlet. Becker '160 shows a blocking projection at the upstreammost portion, at the outer periphery, situated at the air inlet. It would have been obvious to one of ordinary skill in the art to place the blocking projections at the upstreammost portion at the outer periphery of the air inlet, as a well known location for protrusions. It is not clear whether Becker '724 will have the recirculation zone toward the outer periphery. However, Becker '160 also teach an outlet structure of the burner, which appears identical to that disclosed in the present application, and a recirculation zone at the outer periphery of the outlet is inherently present as the outlet configuration of

Becker '160 appears identical to that of the disclosed invention and it is well known in the art that the sudden expansion of the flow at the outlet will inherently cause recirculation zones. It would have been obvious to one of ordinary skill in the art to employ the outlet configuration of the Becker '160, as a well known alternative outlet configuration contemplated for the burner type of Becker '724, where such a configuration will inherently produce the claimed recirculation. Becker appears to illustrate the claimed blocking area ratios of the blocking members. In order to obviate any doubt, it would have been obvious to one of ordinary skill in the art to employ the claimed ratios, as an obvious matter of finding the workable ranges in the art. As for distributing the blocking members asymmetrically, Becker '724 does allow for non-circular symmetry (see Fig. 5) and depending on the axis on which the axis is taken will also appear asymmetric. Alternately, Becker also would teach one of ordinary skill to allow for some variation from symmetry to accommodate burner inlet tolerances and deviations from the idealized case.

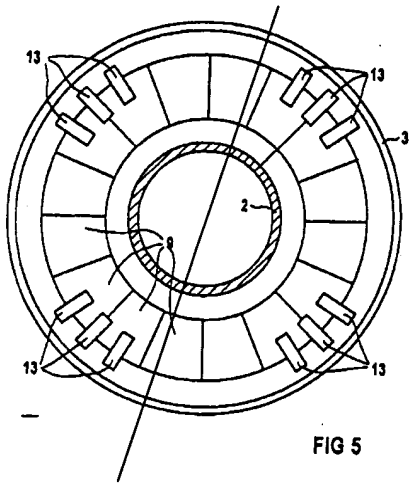

FIG 5

asymmetric about this line

7. Claims 1-3, 7-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poeschl et al (6,189,320) in view of Becker (6,152,724). Poeschl et al teach various aspects of the claimed invention but do not teach specifics of the blocking members, including the use of asymmetric blocking members. Becker '724 teaches a burner apparatus for burning fuel and air to combustion gas comprising a premixing chamber 4 for premixing the fuel and air with an air inlet for the air 5 to enter said premixing chamber and having a cross-sectional area; a fuel inlet 11, 12 for the fuel to enter said premixing chamber an outlet for a mixture of air and fuel to exit said premixing chamber, wherein, said fuel inlet 11, 12 is located between said air inlet and said outlet, further comprising at least one air blocking member 13 situated at the air inlet for stabilizing a burner premixing flame by locally blocking the flow of air entering said premixing chamber so that downstream of said outlet a locally inhomogeneous fuel concentration (e.g. col. 3, lines 5-24 or col. 5, lines 56+, note that largely homogenous implies local areas of inhomogeneous) which inherently generates a locally hot stream of combustion gas that is hotter than the average flame temperature; said air inlet has in said cross-sectional area an outer periphery and with said at least one blocking member located at the outer periphery extending towards said main axis; swirl elements 9; a pilot burner may be present (col. 5, lines 31+); a gas turbine is taught (see abstract); recirculation zone 10 is taught; the claimed area ratios are shown in either Figs 4 or 5. A premixing chamber 4 for premixing the fuel and air having a cross-sectional area and extending

along a main axis 1, and said premixing chamber comprises a ring channel, with said air inlet having a annulus cross-sectional area inclined to said main axis 1, comprising a swirl element 9 disposed in said ring channel for imposing a momentum to said flow of air and for feeding said fuel 11, 12 in said flow of air; an air inlet having a cross sectional area and an outer periphery for the air to enter said premixing chamber, and a fuel inlet 11, 12 for fuel to enter said premixing chamber, and an outlet for a mixture of the fuel and air; the fuel inlet is located between the air inlet and outlet. It would have been obvious to one of ordinary skill in the art to employ the blocking members, as taught by Becker, to enhance the flame stabilization of Poeschl et al. Becker appears to illustrate the claimed blocking area ratios of the blocking members. In order to obviate any doubt, it would have been obvious to one of ordinary skill in the art to employ the claimed ratios, as an obvious matter of finding the workable ranges in the art. As for distributing the blocking members asymmetrically, Becker '724 does allow for non-circular symmetry (see Fig. 5) and depending on the axis on which the axis is taken will also appear asymmetric. Alternately, Becker also would teach one of ordinary skill to allow for some variation from symmetry to accommodate burner inlet tolerances and deviations from the idealized case.

8. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker (6,152,724) in view of either Zappa (4,762,487) or Gutmark et al (6,196,835). Becker teaches various aspects of the claimed invention but do not teach the blocking members width decreasing toward the main axis. Zappa teaches blocking members 35 for the air

inlet and which have a triangular shape. Gutmark et al teach having triangular shaped blocking members 32. It would have been obvious to one of ordinary skill in the art to employ blocking members having a triangular shape, as an equivalent shape for providing a fluid blockage.

Response to Arguments

9. Applicant's arguments filed 4/25/05 have been fully considered but they are not persuasive. Applicant's amendments to claim 21 argued the presence of allowable subject matter. However, it is noted that allowable subject matter was withdrawn as of the most recent office action of 06/13/2005 for the reasons set forth previously and repeated above.

10. Moreover, applicant's arguments are not persuasive and even appear somewhat disingenuous for the subject matter of the claims appears in the applied art.

11. Specifically, Becker '724 teaches the reduction in the velocity behind the blocking members, this will inherently result in a locally rich region developing toward the wall as the same structural features are employed.

> "In addition, **since the flow is slower in its outer region than in its inner region**, the tendency to form vortices is reduced, which likewise substantially helps to stabilize the combustion. However, an increase in the maximum temperature during the combustion does not occur, since all the available air is utilized to burn the fuel.
>
> (17) A first especially preferred development of the device is distinguished by the fact that the air flow delayer provided for delaying a portion of the flow which lies radially on the outside with regard to the axis is circular-symmetrical with regard to the axis, so that the portion of the flow delayed by the air flow delayer is likewise circular-symmetrical with regard to the axis. **The entire flow is thus enveloped by a portion which is markedly slowed down relative to other portions. This slowed-down portion is therefore decisive for the aerodynamic relationships at a boundary surface between**

the flow discharging from the device and the air free of fuel, which, on account of a reduced velocity gradient caused by the delay, leads to suppression of the formation of vortices and thus to the acoustic stabilization of combustion effected in the flow.

(18) The circular-symmetrical air flow delayer is preferably a choke ring disposed in the annular passage and extending over a part of the annular passage which lies radially on the outside with regard to the axis, which choke ring is in particular disposed upstream of the swirl cascade. Furthermore, the choke ring is preferably formed from choke elements, in particular bars, disposed in the annular passage and uniformly distributed about the axis. The choke ring is not intended to completely cover the part of the annular passage over which it extends but is merely intended to choke the flow through this part. The choke ring will therefore always be configured functionally like a screen.

19) A development of the device especially preferred as an alternative is distinguished by the fact that the air flow delayer is constructed to be discontinuously symmetrical, in particular discretely symmetrical, with regard to the axis. In this case, a discontinuously symmetrical configuration defines a configuration which is substantially different from a circular-symmetrical configuration and is distinguished in particular by the fact that it has no (continuous) circular symmetry but if need be has discrete symmetry, e.g. described by a finite symmetry group. This discontinuously symmetrical air flow delayer therefore does not lead to the flow being enveloped by the portion delayed as a body and uniformly, as results in the case of the first especially preferred development described above. In contrast, the flow in an outerlying region has streaks that are delayed relative to other portions of the flow. The slow streaks are likewise suitable for preventing the formation of vortices, which could envelop the flow after it is discharged from the device. This is because the slow streaks form local disturbances in the velocity zone of the flow, which counteract the formation of vortices and can thus lead to the desired acoustic stabilization of a flame produced in the flow, as already described. (see col. 3, lines 5-59)"

"(6) An exemplary embodiment of the invention is shown in FIG. 1. Within the scope of the exemplary embodiment, a choke ring 13 consisting of individual bars attached to the outer body 3 and projecting into the annular passage 4 is provided in front of the swirl cascade 9. The bars cause local pressure losses in the flow 5 and lead to the outer portion of the flow 5, which passes close to the outer body 3, being slowed down or delayed relative to other portions of the flow 5. The slowing down continues through the entire annular passage 4 and leads to a non-uniform distribution of the velocity in the mixture, which flows off into the combustion space 7. This results in the stabilizing effects, already described at the beginning, on the combustion taking place in the combustion chamber 7, to the above explanation of which reference is hereby made. The feeding of the fuel 6 to the flow 5 must take into account **the non-uniform distribution of the velocity in the flow** 5. Therefore, large nozzles 11 are provided for feeding the fuel to the largely unaffected portion of the flow and small nozzles 12 are provided for feeding the fuel 6 to the slowed-down portion of the flow 5. The dimensions of the nozzles 11 and 12 are to be selected in such a way that **a largely homogeneous distribution of the fuel in the flow [largely homogenous implies local inhomogeneity]** is achieved and thus combustion having as low a production of nitrous oxide as possible is ensured. For appropriate construction of the device, computer programs for the numerical modeling of the flow 5 are available to the persons skilled and active in the relevant art, the utilization

> of which computer programs permits an appropriate configuration of the nozzles 11 and 12. (col. 5, lines 42-col. 6, line 3)"

The following excerpt from applicant's specification shows that the slowing down in velocity caused by the flow blocking members also causes the local inhomogeneity at the walls.

> "To achieve the stabilisation effect in a burner having a premixing chamber no essential change of the method for injecting fuel is necessary, as only the flow of air is influenced to generate an enriched fuel/air mixture. The air blocking member is positioned upstream the premixing zone of the premixing chamber. **It delays the portion of the flow of air and so produces a local pressure loss in the flow which causes a lower flow velocity to prevail behind the air blocking member than in the portions of the flow unaffected by the air blocking member**. Beside locally and discrete reduction of air flow caused by the blocking member the air flow as well as the mixture of fuel in air is **almost homogeneous at the outlet** of the premixing chamber. (see page 4, last paragraph)."

It is clear then that since the blocking members of Becker '724 perform the identical function with respect to the velocity it will also perform the identical function on the homogeneity, especially as the physics behind the two are identical. In an analogous manner, the blocking members of Poeschl will also perform the same function.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm

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